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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/804,891	03/13/01	DRENT E	TS0982 (US)

HM12/1101

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EXAMINER	
ZUCKER, P	
ART UNIT	PAPER NUMBER
1623	9

DATE MAILED: 11/01/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/804,891	Applicant(s) DRENT ET AL.	
	Examiner Paul A. Zucker	Art Unit 1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

   a. Page 9, lines 24 and 26 The word 'stearic" is misspelled;

   b. Page 10, line 9 The word 'stearic" is misspelled;

   c. Page 30, line 3 The word "are" should be used instead of "is" after "ester".

   Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sielkin (US 5,679,831 10-1997 and further in view of Drent et al (EP 0495548-A2 10-1992).

Sielkin teaches (Column 1, lines 53-62) the preparation of terminal esters by the carbonylation of an internally saturated olefin in the presence of an alcohol, carbon monoxide, palladium, and a bidentate organic phosphorous, arsenic or antimony ligand at a pH of less than two (measured at 18°C in aqueous solution). Sielkin teaches (Column 4, line 48) the use of this process on 2- and 3-pentenenitrile. Sielkin further teaches (Column 4, line 48) preferred ligand –palladium ratios of 1:1-5:1 corresponding to the instant claimed range, at temperatures (Column 4, lines26-

27) between 50 °C and 200 °C which encompass the instant preferred 80°C-125 °C. The only limitation of the instant process not taught by Sielkin is the use of the simple hydrocarbon linked bidentate ligand. Sielkin teaches a ferrocene linked ligand. Drent, however, teaches (Table II, Pages 10-11, in particular, 2-cyanoethene, page 10, entry XIII) the use of 1,3-(di-tert-butyl phosphino)-propane for use in the carbonylation of olefins. Drent further teaches (Page 3, lines 39-42) that the olefin can be an internal olefin as well. Drent teaches carbonylation conditions that encompass the instant conditions as well, teaching preferred temperatures (Page 4, lines 3-4) between 75 °C and 150 °C ,a palladium catalyst (Page 3, lines 7-10) and ligand-catalyst ratios (Page 3, lines 25-26) of 1:1-5-:1. Thus it would have been obvious for one of ordinary skill in the art to have performed this invention at the time of its creation. The motivation would be to employ a less complex expensive catalyst in the process of Sielkin to improve the overall profitability of the process for the synthesis of ε-caprolactam, an important polymer feedstock. The expectation for success would be high since all elements of the process are taught.

3. Claims 14-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sielkin (US 5,679,831 10-1997 and further in view of Drent et al (EP 0495548-A2 10-1992) and further in view of Di Cosimo et al (US 6,077,955 06-2000). Sielkin teaches (Column 1, lines 53-62) the preparation of terminal esters by the carbonylation of an internally saturated olefin in the presence of an alcohol, carbon monoxide, palladium, and a bidentate organic phosphorous, arsenic or antimony ligand at a pH of less than two (measured at 18°C in aqueous solution). Sielkin teaches (Column 4,

line 48) the use of this process on 2- and 3-pentenenitrile. Sielkin further teaches (Column 4, line 48) preferred ligand –palladium ratios of 1:1-5:1 corresponding to the instant claimed range at temperatures (Column 4, lines26-27) between 50 °C and 200 °C which encompass the instant preferred 80°C-125 °C. Finally, Sielkin teaches (Column 7, lines 11-12) that byproducts of the carbonylation products are branched (see instant Claim 15). The only limitation of the instant process not taught by Sielkin is the use of the simple hydrocarbon linked bidentate ligand. Sielkin teaches a ferrocene linked ligand. Drent, however, teaches (Table II, Pages 10-11, in particular, 2-cyanoethene, page 10, entry XIII) the use of 1,3-(di-tert-butyl phosphino)-propane for use in the carbonylation of olefins. Drent teaches (Page 3, lines 39-42) that the olefin can be an internal olefin as well. Drent teaches carbonylation condition that encompass the instant conditions as well, teaching preferred temperatures (Page 4, lines 3-4) between 75 °C and 150 °C ,a palladium catalyst (Page 3, lines 7-10) and ligand-catalyst ratios (Page 3, lines 25-26) of 1:1-5-:1. Neither Sielkin nor Drent teach the subsequent conversion of pentenenitrile into ε-caprolactam. Di Cosimo, however, teaches (Column 18, line 61- column 19, line 18) the reduction via catalytic hydrogenation of ω-cyanocarboxylic acids to the corresponding ω-aminocarboxylic acids and their subsequent cyclization to the lactams. In particular, Di Cosimo teaches (Example 37, Column 35, line 16 –column 36, line 10) the catalytic hydrogenation of 5-cyanopentanoic acid and cyclization of the resultant 5-aminopentanoic acid salt. Thus it would have been obvious for one of ordinary skill in the art to have performed this invention at the time of its creation.

The motivation would be to employ a less complex expensive catalyst in the process of Sielkin to improve the overall profitability of the process for the synthesis of ε-caprolactam, an important polymer feedstock. The incorporation of a known process for the synthesis of the ultimate target would likewise be obvious since this is the ultimate intended use for the 5-cyanopentanoic acid. The expectation for success would be high since all elements of the process are taught.

Conclusion

4. Claims 1-23 are outstanding. Claims 1-23 are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Zucker whose telephone number is 703-306-0512. The examiner can normally be reached on Monday-Friday 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Geist can be reached on 703-308-1701. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-4556 for regular communications and 703-308-4556 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1235.

PAZ
October 23, 2001

JAMES O. WILSON
PRIMARY EXAMINER
GROUP 1600